

I claim:

- 35 1. A method of tagging a substance for identification comprised of:
  - a.) isolating and assigning an identification code to the substance to be tagged.
  - 40 b.) adding to the substance a taggant comprised of at least two elements, each element having at least two stable isotopes in a selected artificial isotopic abundance ratio wherein said abundance ratio being unchanged by chemical reactions.
  - 45 c.) maintaining a tagging record showing the correlation between the selected isotopic abundance ratio of each element in the taggant and the assigned identification code of the substance.
  - d.) measuring the isotopic abundance ratio of each element of the taggant in the substance, and
  - 50 e.) comparing the results of the measurement with the tagging record to identify the assigned identification code of the substance.
2. A method of applying taggants as described in claim 1 wherein each tagging element is added individually to the substance.
3. A method as in claim 1 wherein the tagging elements are introduced into the substance being tagged in the form of elements or compounds in solution or suspension in a liquid, to be dispersed throughout the substance.
- 55 4. A method as in claim 1 wherein one or more tagging elements are present as elements or compounds in particulate form, a number of said particles being added to the substance.
5. A method as in claim 1 wherein one or more tagging elements are present as elements or compounds embedded in a particulate matrix, a number of said particles being added to the substance.

6. The method of claim 1 wherein the substance is selected from the group comprised of: tires, paint, crude oil, fuel oil, hazardous waste, paper, ink, drugs, raw materials used in the manufacture of drugs, chemicals, compact disks, laser disks, computer disks, video tapes, audio tapes, electronic circuits, ammunition, bullets, gunpowder, explosives, currency, clothing, computers.

7. A method of tagging a substance for identification comprised of:

- a.) isolating and assigning an identification code to the substance to be tagged,
- b.) adding to the substance a taggant comprised of at least two stable isotopes of the same element having a selected artificial isotopic abundance ratio wherein said abundance ratio being unchanged by chemical reactions,
- c.) maintaining a tagging record showing the correlation between the isotopic abundance ratio in the taggant and the assigned identification code of the substance,
- d.) measuring the isotopic abundance ratio of the taggant in the substance, and
- e.) comparing the results of the measurement with the tagging record to identify the assigned identification code of the substance.

8. A method as in claim 7 wherein the tagging elements are introduced into the substance being tagged in the form of elements or compounds in solution or suspension in a liquid, to be dispersed throughout the substance.

9. A method as in claim 7 wherein the tagging element is present as an element or compound in particulate form, a number of said particles being added to the substance.

10. A method as in claim 7 wherein the tagging element is present as an element or compound embedded in a particulate matrix, a number of said particles being added to the substance.

11. The method of claim 7 wherein the substance is selected from the group comprised of: tires, paint, crude oil, fuel oil, hazardous waste, paper, ink, drugs, raw materials used in the manufacture of drugs, chemicals, laser disks, compact disks, computer disks, video tapes, audio tapes, electronic circuits, ammunition, bullets, gunpowder, explosives, currency, clothing, computers.

12. A method of tagging a substance for identification comprised of:

- a.) isolating and assigning an identification code to the substance to be tagged,
- b.) adding to the substance a taggant comprised of at least two elements which are selected from the group of elements having three or more stable isotopes, each selected element having at least two stable isotopes present in a selected artificial isotopic abundance ratio corresponding to the identification code of the substance, and, as an indicator of background contamination, at least one additional stable isotope present at a fixed artificial abundance which is constant for all taggants used within a class of tagged substances, the members of which are not easily distinguishable from one another without reference to identifying taggants wherein said abundance ratio being unchanged by chemical reactions,
- c.) maintaining a tagging record showing the correlation between the isotopic abundance of each element in the taggant and the assigned identification code of the substance, and a record of the concentration of the background indicating isotope or isotopes,
- d.) measuring the isotopic abundance ratio of each element of the taggant in the substance.

- e.) determining the level of background contamination of each of the coding elements by noting the change in concentration of the background indicating isotope or isotopes of each coding element.
- 5 f.) correcting the observed concentration of the coding isotopes of each coding element for the observed background contamination of that element, and
- g.) comparing the results of the corrected measurement with the tagging record to identify the assigned identification code of the substance.
- 10 13. A method of applying taggants as described in claim 12 wherein each tagging element is added individually to the substance.
- 14. A method as in claim 12 wherein the tagging elements
- 15 are introduced into the substance being tagged in the form of elements or compounds in solution or suspension in a liquid, to be dispersed throughout the substance.
- 15 15. A method as in claim 12 wherein one or more tagging elements are present as elements or compounds in particulate form, a number of said particles being added to the
- 20 substance.
- 16. A method as in claim 12 wherein one or more tagging elements are present as elements or compounds embedded in a particulate matrix, a number of said particles being added
- 25 to the substance.
- 17. The method of claim 12 wherein the substance is selected from the group comprised of: tires, paint, crude oil, fuel oil, hazardous waste, paper, ink, drugs, raw materials used in the manufacture of drugs, chemicals, laser disks,
- 30 compact disks, computer disks, video tapes, audio tapes, electronic circuits, ammunition, bullets, gunpowder, explosives, currency, clothing, computers.
- 18. A method of tagging a substance for identification comprised of:
- 35 a.) isolating and assigning an identification code to the substance to be tagged.
- b.) adding to the substance a taggant comprised of at least one element selected from the group of elements having three or more stable isotopes, each selected element
- 40 having at least two stable isotopes present in a selected artificial isotopic abundance ratio corresponding to the identification code of the substance, and, as an indicator of background contamination, at least one additional
- 45 stable isotope present at a fixed artificial abundance which is constant for all taggants used within a class of tagged substances, the members of which are not easily distinguishable from one another without reference to identifying taggants wherein said abundance ratio being unchanged by chemical reactions.
- 50 c.) maintaining a tagging record showing the correlation between the isotopic abundance of each element in the taggant and the assigned identification code of the substance, and a record of the concentration of the
- 55 background indicating isotope or isotopes.
- d.) measuring the isotopic abundance ratio of each element of the taggant in the substance.
- e.) determining the level of background contamination of each of the coding elements by noting the change in
- 60 concentration of the background indicating isotope or isotopes of each coding element.
- f.) correcting the observed concentration of the coding isotopes of each coding element for the observed background contamination of that element, and
- 65 g.) comparing the results of the corrected measurement with the tagging record to identify the assigned identification code of the substance.

19. A method as in claim 18 wherein the tagging elements are introduced into the substance being tagged in the form of elements or compounds in solution or suspension in a liquid, to be dispersed throughout the substance.

20. A method as in claim 18 wherein one or more tagging elements are present as elements or compounds in particulate form, a number of said particles being added to the substance.

21. A method as in claim 18 wherein one or more tagging elements are present as elements or compounds embedded in a particulate matrix, a number of said particles being added to the substance.

22. The method of claim 18 wherein the substance is selected from the group comprised of: tires, paint, crude oil, fuel oil, hazardous waste, paper, ink, drugs, raw materials used in the manufacture of drugs, chemicals, compact disks, laser disks, computer disks, video tapes, audio tapes, elec-

tronic circuits, ammunition, bullets, gunpowder, explosives, currency, clothing, computers.

23. A taggant composition comprising multiple tagging elements, each tagging element consisting of two or more  
5 stable isotopes present in a selected artificial abundance ratio corresponding to an identification code.

24. A taggant composition comprising multiple tagging elements, each tagging element consisting of two or more  
10 stable isotopes present in a selected artificial abundance ratio corresponding to an identification code and one or more isotopes present at a fixed artificial abundance independent of the identification code, such that contamination of the  
taggant by a naturally occurring sample of the tagging  
element will result in a change in isotopic composition  
15 indicative of the degree of contamination.

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25. A taggant pen comprising:

a pen; and  
the pen containing ink ; and  
the ink containing a taggant.

26. The pen of claim 25 further including:

the taggant representative of a first unique identification code;  
a record system having a second unique identification code; and  
the first unique identification code associated in a known manner to the second  
unique identification code.

27. The pen of claim 25 wherein the taggant is an isotopic taggant.

28. The pen of claim 26 wherein the taggant is an isotopic taggant.

29. A method of securing the authenticity of a document comprising:

producing the document; and  
marking the document with a pen, the pen containing a taggant.

30. The method of claim 29 wherein the marking step comprises using a taggant having  
a unique identification code.

31. A method of securing the authenticity of a document comprising:

producing the document; and  
marking the document with tagged ink.

32. A method of securing the authenticity of a document comprising:

producing the document; and  
marking the document with tagged paint.

33. The method of claim 31 wherein the tagged ink contains an isotopic taggant.

34. The method of claim 32 wherein the tagged ink contains an isotopic taggant.

35. A method of verifying destruction of a document comprising:

tagging the document with an isotopic taggant;  
destroying the document; and  
verifying the presence of the taggant in residue remaining after the document is  
destroyed.

36. A taggant spray paint dispenser comprising:

a spray paint dispenser;  
a paint contained in the dispenser; and  
the paint containing a taggant.

37. The spray paint dispenser of claim 36 further including:

a first unique identification code corresponding to the taggant;  
a second unique identification code marked on the spray paint dispenser; and  
the first unique identification code associated in a known manner with the second  
unique identification code.

38. A method of securing the authenticity of a product comprising:

producing the product; and  
marking the product with tagged spray paint.

39. A method of securing the authenticity of clothing comprising:

tagging thread; and  
incorporating the tagged thread in the clothing.